

REMARKS

Claims 1-29 and 36-45 are pending. By this Amendment, claims 30-35 are canceled without prejudice or disclaimer, the drawings, Abstract, specification, and claims 1, 13, 21, 24, 25, and 27 are amended, and claims 36-45 are added. A Request for Approval of Drawing Amendment is filed herewith. No new matter is added. Support for the claims can be found throughout the specification, including the original claims, and the drawings. Reconsideration in view of the above amendments and following remarks is respectfully requested.

The Office Action objected to the drawings because of an informality. In the Request for Approval of Drawing Amendment, Figure 1A is relabeled Figure 1. Accordingly, the objection should be withdrawn.

The Office Action further objected to the drawings as failing to comply with 37 C.F.R. §1.84(b)(5) because certain reference numerals were not mentioned in the description. Regarding Figure 13, the specification has been amended to include reference numerals 130 and 135. Figure 14 has been deleted. Regarding Figure 24, reference numerals 375a and 375b are discussed at page 15, line 17. Accordingly, the objection to the drawings should be withdrawn.

The Office Action objected to the Abstract. A substitute Abstract has been provided herewith. No new matter is added. Accordingly, the objection should be withdrawn.

The Office Action objected to claims 1-5, 13, 21, and 24 because of informalities. Each of the Examiner's comments have been addressed in amending these claims. Accordingly, the objection should be withdrawn.

The Office Action rejected claims 1, 3-7, 10, 12, 13, 15, 20, 24, 27, and 28 under 35 U.S.C. §103(a) as being unpatentable over Allen et al. (hereinafter "the Allen patent"), U.S. Patent No. 5,500,913, in view of Freier et al (hereinafter "Freier"), U.S. Patent No. 6,301,418. The rejection is respectfully traversed.

The claims of this application have been revised in order to expressly recite the tap structures as contemplated herein are "modeled" tap structures formed by using pattern parameters determined by modeling the desired illumination pattern.

The Allen patent, on the other hand, discloses an apparatus and method of fabricating directional fiber optic taps, sensors and other devices with variable angle output. As taught in the Allen patent, the taps can be used to monitor losses due to misalignment of the fiber or losses due to bending and straining of the fiber. As shown in Figure 10 of the Allen patent, taps can be provided at a plurality of positions along the length of the fiber 700. Fiber monitoring attachments 600a, 600b1-600b3, and 600c are used to monitor bends and strains in the fiber 700. Hence, it is the number of photons (which can vary depending on strain) and not a predetermined distribution of photons or "desired illumination pattern" that is provided by the taps in the Allen patent.

Accordingly, the Allen patent does not disclose or suggest one or more modeled tap structures formed in one or more optical fibers or waveguides configured so that, when the light travels through the one or more optical fibers or waveguides, a desired illumination pattern is created by scattering, diffraction, reflection and/or refraction of portions of a light through the one or more modeled tap structures formed by using pattern parameters determined by

modeling the desired illumination pattern, as recited in independent claim 1. With respect to independent claim 24, the Allen patent does not disclose or suggest a continuous modeled tap structure formed in one or more optical fibers or waveguides configured so that, when the light travels through the one or more optical fibers or waveguides, a desired illumination pattern is created by scattering, diffraction, reflection and/or refraction of portions of the light through the continuous modeled tap structure formed by using pattern parameters determined by modeling the desired illumination pattern. With respect to independent claim 27, the Allen patent does not disclose or suggest one or more modeled tap structures formed in one or more photon channeling structures configured so that, when the photons travel through the photon channeling structures, a desired pattern is created by scattering, diffraction, reflection and/or refraction of portions of the photon flux through the one or more modeled tap structures formed by using pattern parameters determined by modeling the desired pattern.

Freier fails to overcome the deficiencies of the Allen patent. Freier discloses an optical waveguide with diffused light extraction. Freier teaches roughening an inner surface of a cladding in a non-uniform manner to provide for extraction of diffused light. See, for example, Figure 3, which shows a core 102 with cladding 104. The inner surface of cladding 104 is roughened to provide a randomly displaced core/cladding interface, shown as indentations 108 in Figure 3. As stated in column 4, lines 39-40 of Freier, "[t]he light leaving through the cladding is diffuse because it is not directed in any preferred direction."

First, there would have been no motivation to modify the apparatus of the Allen patent in view of Freier. The Allen patent teaches tapping light at individual points along the length

of an optic fiber to sense the signal carried in the fiber or the loss at that point due to misalignment of the fiber or bending and straining of the fiber. Freier teaches diffuse light extraction methods that provide light scattered in random directions. Freier teaches that there are a variety of applications that require diffuse rather than directed light, including such applications as lighted display signs, lamps for offices or other work places, neon lighting, and light sources such as incandescent and electrical arc sources. Freier teaches roughening the cladding by sand blasting, brush abrasion, or vibration of particles provided within the cladding. As the Allen patent is directed to tapping light at single points along a length of an optical fiber to sense loss, and Freier teaches diffuse light extraction for illumination purposes, there would have been no motivation to modify the Allen patent in view of Freier.

Further, as discussed above, the Allen patent fails to disclose or suggest the claimed features of the invention. Freier similarly fails to disclose or suggest such features. That is, Freier uses surface roughness, i.e., random indentations or scratches to provide diffuse light extraction. As stated, in column 4, lines 39-40, the light leaving through the cladding is diffuse because it is not directed to any preferred direction. Thus, Freier does not disclose or suggest modeling one or more tap structures to produce a desired pattern or illumination pattern created by scattering, diffraction, reflection, and/or refraction of portions of photon flux or light through the one or more modeled tap structures using pattern parameters determined by modeling the desired pattern or illumination pattern.

Accordingly, the rejection of independent claims 1, 24, and 27 should be withdrawn. Dependent claims 3-7, 10, 12-13, 15, 20, and 28 are allowable at least for the reasons discussed

above with respect to independent claims 1 and 27, from which they respectively depend, as well as for their added features.

The Office Action rejected claims 2, 8, and 9 under 35 U.S.C. §103(a) as being unpatentable over the Allen patent in view of Freier, and further in view of McGaffigan, U.S. Patent No. 6,031,958. The rejection is respectfully traversed.

McGaffigan is merely cited for creating a generally spherical pattern of light, and thus fails to overcome the deficiencies of the Allen patent-Freier combination discussed above. Accordingly, dependent claims 2 and 8-9 are allowable at least for the reasons discussed above with respect to independent claim 1, from which they depend, as well as for their added features.

The Office Action rejected claims 11, 25, and 26 under 35 U.S.C. §103(a) as being unpatentable over the Allen patent in view of Freier, and further in view of Imen et al. (hereinafter "Imen"). The rejection is respectfully traversed.

As discussed above, it would not have been obvious to modify the Allen patent in view of Freier. Further, Freier teaches creating diffuse lighting using randomly placed indentations or scratches which direct light in random directions. Thus, the combination of the Allen patent and Freier fails to disclose one or more modeled tap structures formed in one or more optical fibers or waveguides configured so that, when light travels through the one or more optical fibers or waveguides, an amount of light output through the one or more modeled tap structures is optimized, wherein the one or more modeled tap structures are formed by using pattern parameters determined by modeling an illumination pattern configured for optimized output light, as recited in independent claim 25.

Further, as Imen is merely cited for teaching "a tap with a length larger than width," it fails to overcome the deficiencies of the Allen patent-Freier combination as discussed above. Accordingly, the rejection of independent claim 25 should be withdrawn. Dependent claims 11 and 26 are allowable at least for the reasons discussed above with respect to independent claims 1 and 25, from which they respectively depend, as well as for their added features.

The Office Action rejected claims 14, 16-19, and 29 under 35 U.S.C. §103(a) as being unpatentable over the Allen patent in view of Freier, and further in view of Mori, U.S. Patent No. 4,389,085. The rejection is respectfully traversed.

As Mori is merely cited for teaching "a plurality of light sources having varying illumination powers," Mori fails to overcome the deficiencies of the Allen patent-Freier combination discussed above. Accordingly, dependent claims 14, 16-19, and 29 are allowable at least for the reasons discussed above with respect to independent claims 1 and 27, from which they respectively depend, as well as for their added features.

The Office Action rejected claims 21-23 under 35 U.S.C. §103(a) as being unpatentable over the Allen patent in view of Freier, and further in view of Izumi et al. (hereinafter "Izumi"), U.S. Patent No. 5,528,399. The rejection is respectfully traversed.

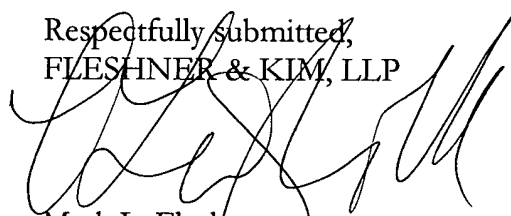
As Izumi is cited merely for teaching a "semiconductor, high power, or light emitting diodes," Izumi fails to overcome the deficiencies of the Allen patent-Freier combination discussed above with respect to independent claim 1, from which claims 21-23 ultimately depend. Accordingly, claims 21-23 are allowable at least for the reasons discussed with respect to independent claim 1, from which they ultimately depend, as well as for their added features.

Added claims 36-45 are allowable at least for the reasons discussed above with respect to independent claims 1, 24, 25 and 27, from which they respectively depend, as well as for their added features.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **Carol L. Druzbeck**, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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Attachment: Substitute Abstract

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